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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,179	01/09/2007	Virgil L. Woods	SDUC1160-1 (041673-3603)	4048
30542	7590	09/13/2010	EXAMINER	
FOLEY & LARDNER LLP P.O. BOX 80278 SAN DIEGO, CA 92138-0278			DEJONG, ERIC S	
			ART UNIT	PAPER NUMBER
			1631	
			MAIL DATE	DELIVERY MODE
			09/13/2010	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/577,179	<b>Applicant(s)</b> WOODS ET AL.	
	<b>Examiner</b> ERIC S. DEJONG	<b>Art Unit</b> 1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-44 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Election/Restrictions***

Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-38, drawn to a method of three-dimensional structure prediction and/or determination of a protein of interest of unknown structure. If this Group of Invention is elected then the Species Election for Group I set forth below is also required.

Group II, claim(s) 39, 40, and 43 drawn to a method of performing molecular replacement.

Group III, claim(s) 41, 42, and 44, drawn to a method for improving accuracy of possible predicted protein structures.

The groups of inventions listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The special technical feature of Group I is the prediction and/or determination of the three-dimensional structure of a protein of interest of unknown structure.

The special technical feature of Group II is the performance of molecular replacement within a crystallographically obtained unit cell of a structurally unknown protein.

The special technical feature of Group III is the determination of the degree to which predicted structures appropriately have experimentally determined fast amide exchange rates on the surface thereof.

***Required Species Election for Group I***

This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

The species are as follows:

Species A (Claims 5-7): wherein a population of sequence overlapping endopeptidase-generated fragments is generated by cleaving said protein with an endopeptidase selected from the group consisting of a serine endopeptidase, a cysteine endopeptidase, an aspartic endopeptidase, a metalloendopeptidase, a threonine endopeptidase, and combinations of any two or more thereof.

Species B (Claim 8): wherein a population of sequence overlapping endopeptidase-generated fragments is generated by two or more endopeptidases used in combination.

Species C (Claim 9): wherein at least one endopeptidase is newlase or *Aspergillus* protease XIII.

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Species D (Claim 10): wherein at least one endopeptidase is an acid tolerant *Aspergillus* protease.

Species E (Claims 11-14): wherein a population of sequence-overlapping endopeptidase-generated fragments is generated at a pH of about 1.8-3.4, 2-3, 2-2.5, and 2.5-3.0.

Species F (Claims 15-17): wherein a population of sequence overlapping endopeptidase-generated fragments is generated in less than about five minutes of exposure to protease, in less than about one minute of exposure to protease, and in less than about 40 seconds of exposure to protease.

Species G (Claim 18): further comprising comparing the quantity of isotope and/or rate of exchange of hydrogen at a peptide amide hydrogen with said isotope on a plurality of endopeptidase fragments in said population of sequence-overlapping endopeptidase-generated fragments with the quantity of isotope and/or rate of exchange of hydrogen at a peptide amide hydrogen on at least one other endopeptidase fragment in said population of sequence-overlapping endopeptidase-generated fragments and wherein said quantities are corrected for back-exchange loss subsequent to the initiation of slowed exchange conditions in an amino acid sequence-specific manner.

Species H (Claim 19): wherein labeled peptide amides are localized in an amino acid sequence-specific manner by measuring rates of exchange as a function of time under slowed exchange conditions.

Species I (Claim 20): wherein said population of sequence overlapping endopeptidase generated fragments contains a plurality of sequence-overlapping fragments wherein more than half of the members of said population have sequences that overlap other members of said population over all but 1-5 amino acid residues.

Species J (Claim 22): wherein determining the quantity and rate of exchange of peptide amide hydrogen(s) is carried out contemporaneously with generating a population of sequence-overlapping endopeptidase-generated fragments.

Species K (Claim 23): further comprising determining off-exchange rates of labeled peptide amide under conditions of slowed hydrogen exchange and random coil conditions from a plurality of fragments and fragment differences.

Species L (Claims 27-29): further comprising the use of conditions that effect protein denaturation under slowed exchange conditions prior to generation of said fragments.

Species M (Claims 30 and 31): further comprising disrupting disulfide bonds in the labeled protein prior to generating said fragments.

Applicant is required, in reply to this action, to elect a single species to which the claims shall be restricted if no generic claim is finally held to be allowable. The reply must also identify the claims readable on the elected species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered non-responsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise require all the limitations of an allowed generic claim. Currently, the following claim(s) are generic: 1-4, 21, 24-26, and 32-38.

#### REQUIREMENT FOR UNITY OF INVENTION

As provided in 37 CFR 1.475(a), a national stage application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept ("requirement of unity of invention"). Where a group of inventions is claimed in a national stage application, the requirement of unity of invention shall be fulfilled only when there is a technical relationship among those inventions involving one or more of the same or corresponding special technical features. The expression "special technical features" shall mean those technical features that define a contribution which each of the claimed inventions, considered as a whole, makes over the prior art.

The determination whether a group of inventions is so linked as to form a single general inventive concept shall be made without regard to whether the inventions are claimed in separate claims or as alternatives within a single claim. See 37 CFR 1.475(e).

### WHEN CLAIMS ARE DIRECTED TO MULTIPLE CATEGORIES OF INVENTIONS

As provided in 37 CFR 1.475(b), a national stage application containing claims to different categories of invention will be considered to have unity of invention if the claims are drawn only to one of the following combinations of categories:

- (1) A product and a process specially adapted for the manufacture of said product; or
- (2) A product and process of use of said product; or
- (3) A product, a process specially adapted for the manufacture of the said product, and a use of the said product; or
- (4) A process and an apparatus or means specifically designed for carrying out the said process; or
- (5) A product, a process specially adapted for the manufacture of the said product, and an apparatus or means specifically designed for carrying out the said process.

Otherwise, unity of invention might not be present. See 37 CFR 1.475(c).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC S. DEJONG whose telephone number is (571)272-6099. The examiner can normally be reached on 8:30AM-5:00PM.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marjorie Moran can be reached on (571) 272-0720. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ERIC S. DEJONG/  
Primary Examiner, Art Unit 1631